Original Article

Epidemiology of lung cancer patients admitted to tertiary level hospitals in Karnataka

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Abstract

Introduction: *Epidemiological observations confirm the significant burden of lung cancer in India, contributing significantly toward the cancer morbidity and mortality. The present study was conducted to assess the epidemiology as well the clinical and radiological features of various types of lung cancer and the recent trends in the demographic patterns of patients with lung cancer.*

Methodology: *This retrospective study was done on patients with a histological diagnosis of carcinoma lung. Using a pre-designed semi-structured study proforma, patient information like demography, smoking history, radiological findings and histopathological diagnosis was noted.*

Results: *Mean age of the patients included in the study was 55 years, males comprised 65% of the study population and half of all study participants were smokers. Most common symptoms among the patients were cough, dyspnea and loss of appetite. Histologically, adenocarcinoma was the most common type of cancer (38%), followed by squamous cell carcinoma (25%). Large cell and small cell carcinoma was 8% and 9% respectively. Undifferentiated cases comprised 20% of the population. Squamous cell cancer cases and small cell cancer cases were aged on the higher side, adenocarcinoma and undifferentiated cancer cases were aged on the lower side. Gender, smoking status and radiological appearance were not significantly different between the various cancer types.*

Conclusions: *In our study population, adenocarcinoma was the most common type of lung cancer histologically. Squamous cell and small cell cancer cases were aged on the higher side, while adenocarcinoma and undifferentiated cancer cases were aged on the lower side.*

Keywords: *Lung cancer; Epidemiology; Histology; Smoking status.*

Introduction

There is a dearth in our current understanding of the changing epidemiological trends of lung cancer among Indian patients. Smoking tobacco, both cigarettes and beedis, is the principal risk factor for causation of lung cancer in Indian men; however, among Indian women, the association with smoking is not strong, suggesting that there

could be other risk factors besides smoking. According to the GLOBOCAN report, the estimated incidence of lung cancer in India was 70,275 in all ages and both sexes; the crude incidence rate per 100,000 was 5.6, the age- standardized rate per 100,000 (world), i.e. ASR (W) was 6.9, and the cumulative risk was 0.85. The overall estimated lung cancer mortality in India in 2012 was 63,759, making it the third most common cause of cancer- related mortality in India after breast and cervical cancer.[1] Despite numerous advances in recent years in terms of diagnostic methods, molecular changes, and therapeutic interventions, the outcomes of the lung cancer patients remain poor; hence, a better understanding of the risk factors may impact the preventive measures to be implemented at the community level. Several epidemiological observations performed across varied demographic cohorts in India confirm the significant burden of lung cancer in India, contributing significantly toward the cancer morbidity and mortality.[2] The present study was conducted to assess the epidemiology as well the clinical and radiological features of various types of lung cancer and the recent trends in the demographic patterns of patients with lung cancer.

Methodology
Study Design and Sampling
This retrospective study was done on patients with an established diagnosis of carcinoma lung. These patients were admitted at the General Medicine ward of Civil Hospital and Department of Medicine at Al-Ameen Medical College, Vijayapur during a period of three years (2013 – 2016). All patients with histologically confirmed diagnosis of primary carcinoma lung admitted and being treated at our department were included in the study. This included patients referred to our department from other centres or other departments. Patients without histological confirmation and with just clinical or radiologically suspected carcinoma were not included in the study. Patients with secondary in

the lung from other sites were also excluded from the study. Patients were explained the purpose of the study and a written consent was obtained before being enrolled for the study. Institutional Ethics Committee approved the study.

Data Collection and Data Analysis
During the study period, 100 patients fulfilling the study criteria were enrolled. Personal identifiers were removed so as to maintain confidentiality. Data was obtained from the medical records of the hospital. Those who expired during stay or left against medical advice for various reasons were obtained from the medical records directly. Using a pre-designed semi-structured study proforma, patient information was noted. Demographic information of the patients was noted. Smokers were classified as 'never smoked' and 'smokers'. The initial radiological presentation was recorded. Though a plain chest x-ray was used as the initial screening imaging technique, the findings were always confirmed by a Computed Tomography (CT) of the thorax. High Resolution CT scan or contrast enhanced CT scan were advised as deemed appropriate by the treating physician. Histo-pathological tissue diagnosis of each patient was obtained. The final pathological diagnosis was arrived at by meticulous histological studies and molecular markers. Medical history of taking anti-tubercular treatment was also noted.

Data were analysed in SPSS version 23 (IBM, New York). Quantitative data were described as mean and standard deviation and qualitative data as frequencies. Means of various quantitative variables were compared between the two study groups using student's t test and frequencies of qualitative variables were compared using chi-square or Fisher's exact, p value less than 0.05 was taken as statistically significant.

Results
Mean age of the patients included in the study was 55 years, 55.37 years among males and 53.2 among females. Males comprised 65% of the study population and half of all study participants were smokers (Table 1). Most common

symptomsamong the patients were cough (60%), dyspnea (40%) and loss of appetite (32%). Other less common symptoms were hemoptysis, chest pain, fever, hoarseness of voice, Superior Vena Cava syndrome and low backache. Histologically, adenocarcinoma was the most common type of cancer (38%), followed by squamous cell carcinoma (25%). Large cell and small cell carcinoma was 8% and 9% respectively. Undifferentiated cases comprised 20% of the population. Table 2 describes how various patient variables compared between different cancer types. Age of the patients was significantly different between different cancer types (p value < 0.001). Where squamous cell cancer cases and small cell cancer cases were aged on the higher side, adenocarcinoma and undifferentiated cancer cases were aged on the lower side. Gender was not significantly associated with cancer type (p value = 0.6). Similarly, smoking status and radiological appearance was not significantly different between the various cancer types.

Table 1 Characteristics of the patients included in the study

Variable	n	%
Gender distribution		
Males	65	65%
Females	35	35%
Ever smoked		
Yes	50	50%
No	50	50%
Symptoms		
Cough	62	62%
Dyspnea	40	40%
Loss of appetite	32	32%
Hemoptysis	20	20%
Chest pain	13	13%
Fever	9	9%
Hoarseness of voice	7	7%
Superior Vena Cava syndrome	6	6%
Low backache	5	5%
Type of cancer diagnosed histologically		
Squamous cell carcinoma	25	25%
Adenocarcinoma	38	38%
Large cell	8	8%
Small cell	9	9%
Undifferentiated	20	20%

Table 2 Comparing various variables among patients with different types of lung cancers

	SCC	AC	LC	SC	UD	p value
Mean age (in years)	60 ± 10.6	48.16 ± 8.05	59 ± 10.29	61 ± 8.88	55.5 ± 10.21	< 0.001
Gender						
Males	19	22	6	6	12	0.6
Females	6	16	2	3	8	
Smoking status						
Yes	16	14	5	5	10	0.26
No	9	24	3	4	10	
Radiological appearance						
Mass lesion	19	27	5	6	13	0.96
Pleural effusion	2	5	1	2	3	
Consolidation	7	17	3	3	9	

SCC: Squamous Cell Carcinoma; ACC: Adenocarcinoma; LC: Large Cell carcinoma; SC: Small Cell carcinoma; UD: undifferentiated

Discussion

In the present study, 65% of the study participants were males. As per the GLOBOCAN 2008 report, males predominate with a male:female ratio of 4.5:1, and this ratio varies with age and smoking status. The ratio increased progressively till 51–60 years and then remained steady. Mean age of the patients included in our study was 55 years. The current demographic pattern of lung cancer in India appears to be similar to that seen in the Western countries approximately 40 years ago. There appears to be a marginal increase in the mean age of diagnosis of lung cancers in India over the years from 52.16 years during 1958–1985 to 54.6 years during 1985–2001.A meta-analysis of 41 studies showed that environmental tobacco exposure carries a relative risk of developing lung cancer of 1.48 (1.13–1.92) in males and 1.2 in females (1.12–1.29).[3]

Most common symptoms among our patients were cough, dyspnea and loss of appetite. Cough is present in 50 to 75% of lung cancer patients at presentation and occurs most frequently in patients with squamous cell and small cell carcinomas, because of their tendency to involve central airways.[4] The new onset of cough in a smoker or former smoker should raise suspicion that lung cancer is present. Bronchorrhea or cough productive of large volumes of thin, mucoid secretions may be a feature of bronchoalveolar cell carcinoma and usually indicates advanced disease. Both NSCLC and SCLC often cause a post-obstructive pneumonia. However, bronchiectasis is uncommon because lung cancer usually progresses too rapidly for bronchiectasis to develop. In contrast, slow-growing neoplasms such as carcinoid tumor or hamartoma are more likely to present with bronchiectasis. Shortness of breath is a common symptom in patients with lung cancer at the time of diagnosis, occurring in approximately 25% of cases.[1] Dyspnea may be due to extrinsic or intraluminal airway obstruction, obstructive pneumonitis or atelectasis, lymphangitic tumor spread, tumor emboli, pneumothorax, pleural effusion, or pericardial effusion with tamponade. Partial obstruction of a bronchus may cause a localized wheeze, heard by the patient or by the clinician on auscultation, while stridor can result from obstruction of larger airways. Hemoptysis was reported as a symptom in only 20% of our patients. In a patient with hemoptysis, the likelihood of lung cancer varies from 3 to 34% in different series depending upon the patient's age and smoking history.[5] In smokers with hemoptysis and a nonsuspicious or normal chest radiograph, bronchoscopy will diagnose lung cancer in about 5% of cases.[6]

Histologically we observed that adenocarcinoma to be the most common type of lung cancer (38%), followed by squamous cell carcinoma (25%). Large cell and small cell carcinoma was 8% and 9% respectively. Undifferentiated cases comprised 20% of the population. In the Western countries and most of the Asian countries, adenocarcinoma has surpassed squamous cell carcinoma as the most common histologic variant of lung cancer. This shift seems to be attributable partly to the changed smoking pattern and increasing incidence of lung cancer in women and non-smokers. Krishnamurthy et al reported that the most common histology was adenocarcinoma (42.6%), followed by squamous cell carcinoma (15.6%), large cell carcinoma (2.3%), and others (7%).[7] Similarly, Malik et al found adenocarcinoma to be the most common histology (37.3%) after expert pathological review.[8]

Conclusion

In our study population, adenocarcinoma was the most common type of lung cancer histologically. Most common symptoms among the patients were cough, dyspnea and loss of appetite. Where squamous cell cancer cases and small cell cancer cases were aged on the higher side, adenocarcinoma and undifferentiated cancer cases were aged on the lower side. Gender, smoking status and radiological appearance was not significantly different between the various cancer types.

References

1. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA: a cancer journal for clinicians. 2018 Nov;68(6): 394-424.
2. Viswanathan R, Sen Gupta, Iyer PV. Incidence of primary lung cancer in India. Thorax1962;17:73- 6.
3. Zhong L, Goldberg MS, Parent ME, Hanley JA. Exposure to environmental tobacco smoke and the risk of lung cancer: A meta- analysis. Lung Cancer 2000; 27:3- 18.

4. Chute CG, Greenberg ER, Baron J, et al. Presenting conditions of 1539 population-based lung cancer patients by cell type and stage in New Hampshire and Vermont. Cancer 1985; 56:2107.

5. Hirshberg B, Biran I, Glazer M, Kramer MR. Hemoptysis: etiology, evaluation, and outcome in a tertiary referral hospital. Chest 1997; 112:440.

6. Colice GL. Detecting lung cancer as a cause of hemoptysis in patients with a normal chest radiograph: bronchoscopy vs CT. Chest 1997; 111:877.

7. Krishnamurthy A, Vijayalakshmi R, Gadigi V, Ranganathan R, Sagar TG. The relevance of "nonsmoking- associated lung cancer" in India: A single- centre experience. Indian J Cancer 2012;49:82- 8.

8. Malik PS, Sharma MC, Mohanti BK, Shukla NK, Deo S, Mohan A, et al.Clinico- pathological pro le of lung cancer at AIIMS: A changing paradigmin India.Asian Pac J Cancer Prev 2013;14:489- 94.